REMARKS

Status of Application

Claims 1-8 and 10-20 are pending in the application; the status of the claims is as follows:

Claims 1-8, 10-18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,184,940 B1 to Sano ("Sano") in view of U.S. Patent No. 6,191,408 B1 to Shinotsuka et al. ("Shinotsuka") and U.S. Patent No. 6,995,791 B2 to Skow ("Skow").

Claim 19 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of U.S. Patent No. 6,972,800 B2 to Sano et al. ("Sano et al.").

35 U.S.C. § 103(a) Rejections

The rejection of claims 1-8, 10-18, and 20 under 35 U.S.C. § 103(a), as being unpatentable over Sano in view of Shinotsuka and Skow, is respectfully traversed based on the following.

Claim 1 recites:

An image-sensing apparatus comprising:
    a solid-state image sensor including:
        a plurality of pixels that perform photoelectric conversion so as to generate output signals that vary with a first characteristic in a first region such that the output signals vary linearly with respect to an amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to the amount of incident light; and
        a plurality of types of color filters provided in vicinity of the pixels; and
    a white balance circuit that performs white balance processing by performing, on at least one of different types of chrominance signals outputted

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as corresponding to the different types of color filters from the solid-state image sensor, different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data.

Thus, claim 1 requires performing different white balance processing on signals that vary linearly with incident light relative to signals that vary logarithmically with incident light.

As noted on page 3 of the Advisory Action dated October 17, 2008 (the "Advisory Action"), Sano does not disclose an image sensor having the claimed first and second characteristics, i.e., linear and logarithmic regions. For this reason, Sano cannot disclose performing different white balance processing on signals that vary linearly relative to those that vary logarithmically.

To overcome this shortcoming of Sano, the Advisory Action, on page 4, asserts, "The photosensor signal processing apparatus (5) of Shinotsuka gives one skilled in the art the motivation to combine Shinotsuka with Sano in order to suppress noise due to the temperature variation of ambient light." Shinotsuka discloses that it corrects noise due to temperature variations by multiplying the output from an individual sensor by a correction factor. *See* Shinotsuka col. 12, l. 46 through col. 13, l. 18. Shinotsuka does not disclose that this correction factor is a function of first and second regions, i.e., linear and logarithmic regions of the image sensor. In fact, the correction factor disclosed by Shinotsuka for correction of noise due to temperature variation is a constant, áT, for all characteristics. *See* Shinotsuka col. 12, l. 63 through col. 13. l. 11. Thus, while Shinotsuka may or may not disclose an image sensor having the claimed first and second characteristics, the motivation to combine Shinotsuka with Sano is based upon a feature that does not depend upon first and second characteristics. In other words, if one combined the feature used to justify combining Shinotsuka with Sano, the result would not be "a white balance circuit that performs white balance processing by performing, . . . different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data." Thus, the reason for creating the combination of Sano and Shinotsuka is faulty.

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Further, since the Advisory Action relies upon Skow for the claimed "plurality of types of color filters," the Advisory Action effectively admits, as it must, that Shinotsuka does not disclose a plurality of types of color filters. *See* Advisory Action at 4. Because Shinotsuka does not disclose a plurality of types of color filters, it cannot disclose "a white balance circuit that performs white balance processing by performing, <u>on at least one of different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor</u>, different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data." *Emphasis added.*

In summary, for two distinct reasons, the combination of Sano and Shinotsuka fails to disclose or suggest each limitation of claim 1, and thus cannot render claim 1 obvious.

The Advisory Action includes Skow with the combination of Sano and Shinotsuka for its disclosure of different types of color filters. The motivation for adding Skow is found in the Office Action dated July 11, 2008 (the "Office Action"). The Office Action states that, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with color filters in order to provide white balance for a Bayer Pattern digital image for use in various applications." *See* Office Action at 4. The addition of color filters to an image sensor does <u>not</u> provide white balance as asserted by the Office Action. In fact, the variation in the transmissivity of the color filters themselves <u>creates</u>, in part, <u>the need</u> for white balancing. As an example, one may start with three sensors that have identical outputs as a function of incident white light. One could then create a full color sensor by placing red, green, and blue filters over the three sensors. Assume that the red filter has a very broad bandwidth of 40 nm, the green filter has a moderate bandwidth of 20 nm, and the blue filter has a bandwidth of 10 nm. Due to the differences in the bandwidth of the filters, the signals output by the sensors will be very different. In particular, the magnitude of the red signal will be far greater than the magnitude of the blue signal, while the magnitude of the green signal would fall between that of the red and blue signals. It is this variation between the magnitudes of the red, green, and blue

signals that must be "white balanced." In other words, modifying the image sensor of Sano with color filters creates white _imbalance_ not white balance. As such, the motivation provided in the Office Action must fail. The result is that the Office Action and the Advisory Action provide no support for creating the combination of Sano, Shinotsuka, and Skow.

Thus, for at least one more distinct reason, the combination of Sano, Shinotsuka, and Skow fails to disclose or suggest each limitation of claim 1, i.e., neither the Advisory Action nor the Office Action raise a *prima facie* case of obviousness with respect to claim 1. Claims 2-6 depend from claim 1. As the combination of Sano, Shinotsuka, and Skow fails to render obvious claim 1, claims 2-6 are non-obvious due at least to their dependence from non-obvious claim 1.

Claim 7 recites:

An image-sensing apparatus comprising:
    a solid-state image sensor including:
        a plurality of pixels that perform photoelectric conversion so as to generate output signals that vary with a first characteristic in a first region such that the output signals vary linearly with respect to an amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to the amount of incident light; and
        a plurality of types of color filters provided in vicinity of the pixels; and
    a white balance circuit having a first look-up table in which is stored information with which to perform white balance processing on different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor,
    wherein the first look-up table provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions.

As shown above, the combination of Sano, Shinotsuka, and Skow cannot render claim 7 obvious due to the required white balance circuit and the fact that creating the combination in the first place is flawed. Claims 8 and 10-17 depend from claim 7. As the combination of

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Sano, Shinotsuka, and Skow fails to render obvious claim 7, claims 8 and 10-17 are non-obvious due at least to their dependence from non-obvious claim 7.

Similar to claim 7, the white balance circuit of claim 18 has "a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor." In other words, claim 18 requires a white balance circuit that performs white balancing on outputted chrominance signals that vary either linearly or logarithmically depending upon the region. As shown above, the combination of Sano, Shinotsuka, and Skow cannot render claim 18 obvious due to the required white balance circuit and the fact that creating the combination in the first place is flawed. Claim 20 depends from claim 18. As the combination of Sano, Shinotsuka, and Skow fails to render obvious claim 18, claim 20 is non-obvious due at least to its dependence from non-obvious claim 18.

Accordingly, it is respectfully requested that the rejection of claims 1-8, 10-18, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow, be reconsidered and withdrawn.

The rejection of claim 19 under 35 U.S.C. § 103(a), as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of Sano et al., is respectfully traversed based on the following.

Claim 19 depends from claim 18, which was shown above to be non-obvious over the combination of Sano, Shinotsuka, and Skow. The addition of Sano et al. to this combination fails to overcome this deficiency. First, the motivation for creating the combination of Sano, Shinotsuka, and Skow is flawed. Further, the motivation for creating the combination of Sano, Shinotsuka, Skow, and Sano et al. is even further flawed. As recited on page 13 of the Office Action, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing

apparatus, as recited in claim 7, in order to provide contrast thereby improving the dynamic range performance." Thus, the Examiner employs claim 7 of the pending application as the motivation to combine references. This runs counter to form paragraph 7.37.03, which recites:

> ¶ 7.37.03 Unpersuasive Argument: Hindsight Reasoning
> In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Because the Examiner's motivation for combining Sano et al. does include knowledge gleaned only from the applicant's disclosure, i.e., claim 7, the motivation is improper. Because the motivation to combine is improper, the combination of Sano, Shinotsuka, Skow, and Sano et al. cannot create a *prima facie* case of obviousness with respect claim 19.

Accordingly, it is respectfully requested that the rejection of claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of Sano et al., be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed

as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin LLP Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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